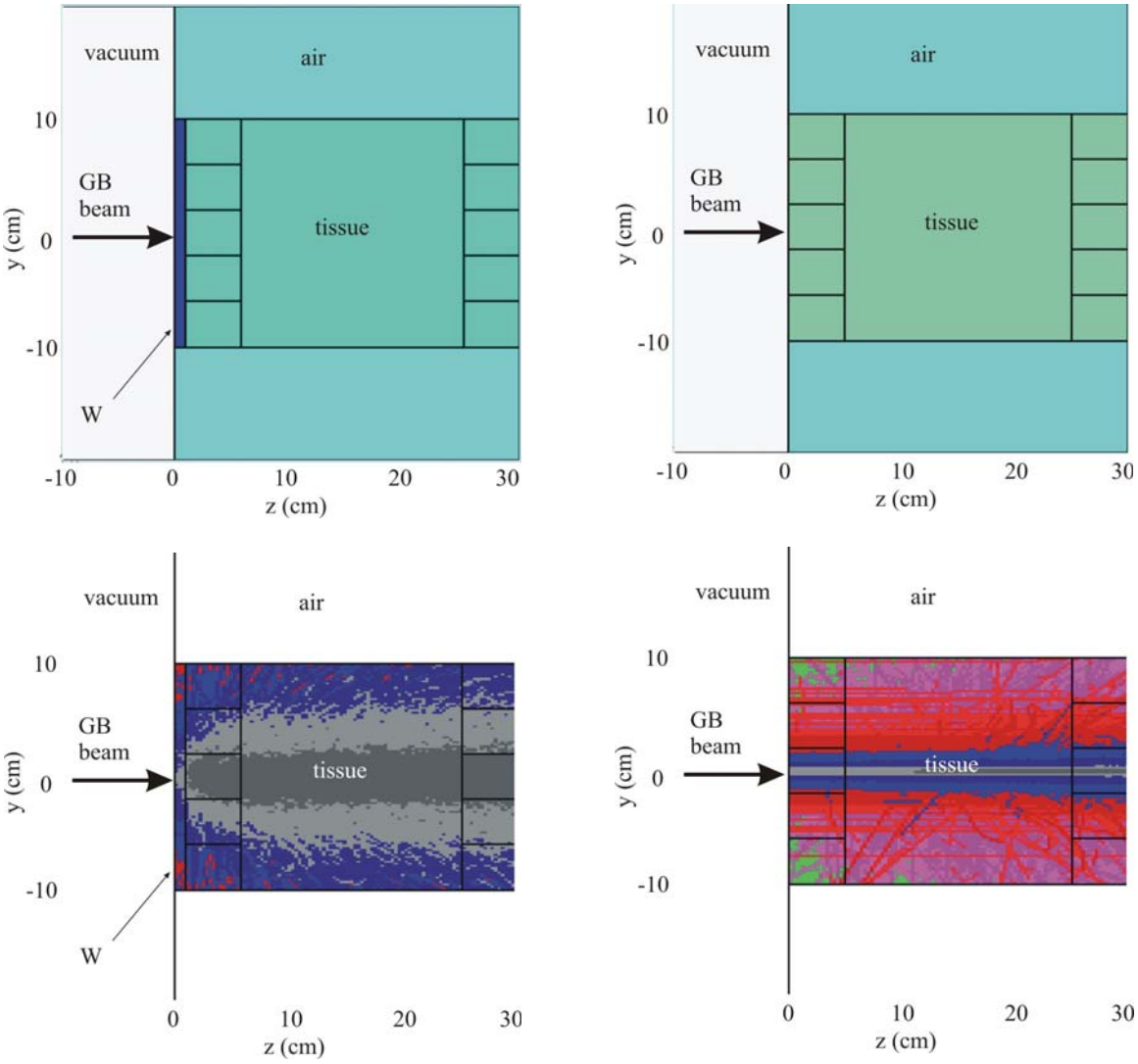
Minutes of the LCLS BLM Simulations Working Group
December 19, 2007
Attendees/Argonne: W. Berg, J. Dooling M. White, B. Yang; /SLAC: A. Fasso, P. Krejcik, H. Nuhn, M. Santana.

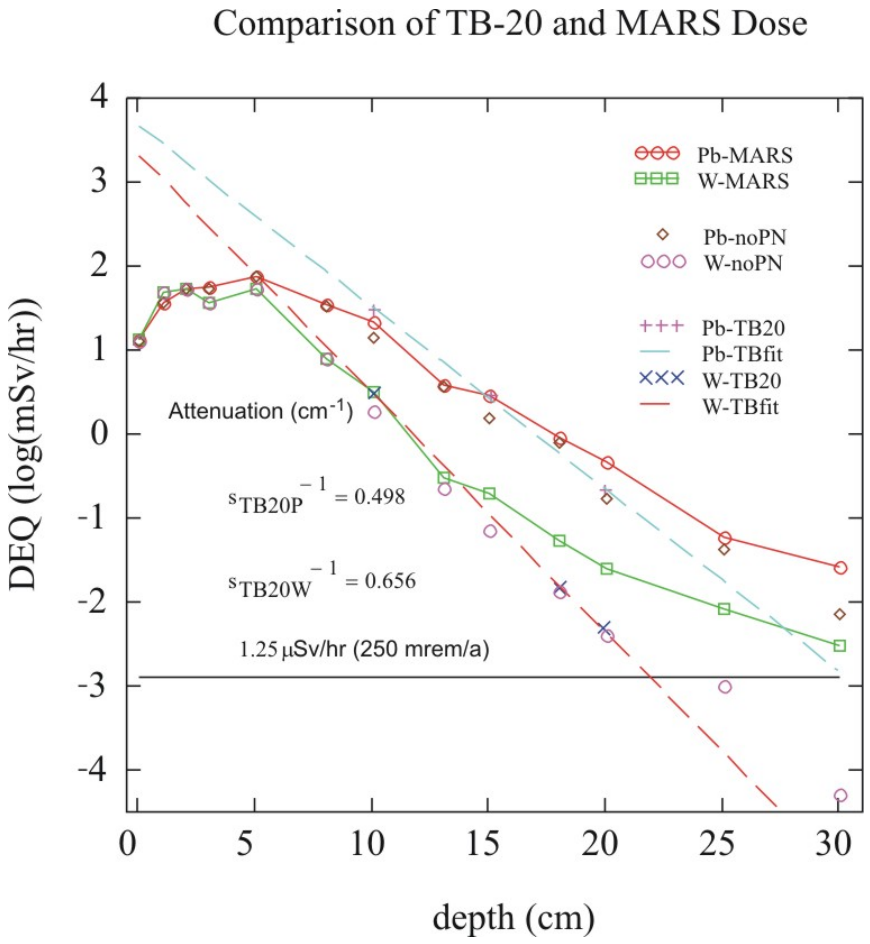
Notes:

Energy-dependent matching to the undulators is provided by QUM4 quadrupoles.

JD requested input files for LCLS MAD model; HDN will provide. HDN inquired when simulation results would be available. JD said preliminary results from MARS would be ready by early January. MS requested geometry and materials for the BLM radiators; WB said he would send to HDN. PK asked about the best thickness of tungsten (W) to maximize the shower in the radiator. JD said he would provide MARS simulation results showing how total dose in a tissue target varied with W and lead (Pb) shielding thicknesses. The dose results for the simple shielding geometries are shown below.



Specifically, the geometry (top) and total dose equivalent (DET in mSv/hr, bottom) are presented for the cases of 1 cm of W (left) ahead of the tissue phantom as well as for no shielding (right) of the secondary shower. The primary electron energy is 7.7 GeV. The secondary, gas bremsstrahlung (GB) shower is generated by passing the primary electron beam through 24 cm of 1 atmosphere air. The deposition of energy in the tissue is substantially increased with the W plate. The equivalent dose (DEQ, mSv) versus W and Pb shielding thickness is shown below for the secondary GB shower just described. A more relevant number in this case might be just the dose (energy per mass). Note the "TB-20" results come from an EGS4 calculation (no neutrons).



The next meeting is scheduled for Wednesday January 9, 2008, 4:30 PM CST.